

Obesity and Immunometabolism: Nutritional Consideration to Covid Times

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Received: September 25, 2020; **Published:** October 03, 2020

Nutritional intervention in obesity usually appears to concentrate exclusively on lowering weight without taking into account an appropriate approach for the metabolic disorders involved in oxidative stress and inflammation. Further than weight, functional nutrition therapy in people with obesity requires the evaluation of dysbiosis, oxidative stress and chronic inflammatory status to incorporate dietary interventions using precise doses of antioxidant, anti-inflammatory and immunomodulatory bioactive compounds [1].

Recently, elderly people and people of all ages who may have serious underlying health problems, combined with obesity, may be at high risk from COVID-19 for severe illness. Because it is still soon to include solid evidence to confirm this in this pandemic, it is reasonable to think that some patients with obesity will have many obesity-related health problems that may be associated with a more severe path of COVID-19 disease, particularly extreme obesity with a body mass index over 40 [2]. In the intensive care environment, patients with severe obesity are usually more difficult to treat demographically, and may fail to recover if they experience some serious illness, especially respiratory infections such as COVID-19. Not a solution to COVID-19, but healthy eating habits enhance the activity of the immune system, promote immunometabolism, and are a modifiable component of chronic disease development closely correlated with COVID-19 deaths [3,4]. In the inherent immune response to infection, regulation of immune cell bioenergetics and metabolic capacity plays a central role, and as we seek to tackle this current global health threat, the innate immune system's immunometabolism warrants attention [5].

For some time, the relationships between food, nutritional status, and immune function have been under study. Together with the pro-oxidative and pro-inflammatory environment of obesity, nutrient competition is an aspect that promotes a deficient immune system with compromised immunocompetence, rendering the body more vulnerable to infections and their complications.

Via the bloodstream, immune cells actively "control" the body and spread to various tissues where they face different environmental conditions. During homeostasis, and particularly during an immune response, nutritional accessibility can vary, generating demand for immune cells that are highly metabolic [6-8]. It has been seen in recent years that cellular metabolism regulates immune cell activity and differentiation and that a particular metabolic structure of the disease might provide a reason for the immune system dysfunction found in people with obesity.

Obesity is marked by low concentrations of enzyme antioxidants in addition to what has already been described [9,10], adding that a diet low in vegetables contributes to low levels of dietary antioxidants, further depressing the body's protection response to oxidative stress and with sex-related differences [11]. It was stressed that circulatory levels of carotenoids, vitamins E and C, as well as zinc, magnesium and selenium, have been inversely associated with obesity and body fat mass [12]. Similarly, the homeostasis of energy metabolism and particularly the immune response is impaired by intestinal dysbiosis caused by poor eating habits [13].

Moreover, obesity is a diverse collection of metabolic disorders involving interactions between the immune system, the genome, and the microbiome. Immuno-nutrition has been emphasizing for years the significant role that essential nutrients, food intake, environmental exposure, and nutrigenomic effects function on the immune system's capacity to respond to and overcome infections [14]. The function of nutrients and their interactions with the immune system and chronic metabolic diseases actually supports scientific evidence for the assessment and evaluation of health professionals in the development of appropriate nutritional interventions [15]. The key bioactive compounds that have been shown to be successful in the treatment of oxidative stress and inflammation in people with obesity and that have an immunomodulatory impact are: Ascorbic acid, Vitamin D and Probiotics.

In view of the current COVID-19 pandemic, people with obesity should not have a common diet; on the otherhand, in order to respond to effective nutrition strategies, they need a personalized assessment of their oxidative, pro-inflammatory, microbiota and immunological tolerance status. Blood levels below normal for ascorbic acid and vitamin D are observed in people with obesity, in addition to dysbiosis. Recently, it has demonstrated that supplementation with probiotics, ascorbic acid and/or vitamin D results in metabolic modifications that may be an immunomodulatory measure for infection management.

Disclosure Statement

The authors declare that there are no conflicts of interest.

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Volume 5 Issue 11 November 2020

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